

SENATE RECORD VOTE ANALYSIS

105th Congress
1st Session

Vote No. 193

July 22, 1997, 5:38 pm
Page S-7841 Temp. Record

VA-HUD APPROPRIATIONS/Space Station Termination

SUBJECT: Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Bill for fiscal year 1998 . . . S. 1034. Bond motion to table the Bumpers amendment No. 944.

ACTION: MOTION TO TABLE AGREED TO, 69-31

SYNOPSIS: As reported, S. 1034, the Departments of Veterans Affairs and Housing and Urban Development, and Independent Agencies Appropriations Bill for fiscal year 1998, will provide a net of \$90.971 billion in new budget authority. Section 8 welfare housing budget authority will be increased substantially (outlays will stay at the level necessary to keep the current number of subsidized housing units) and Federal Emergency Management Agency (FEMA) disaster funding will be decreased.

The Bumpers amendment would strike \$1.5 billion of the \$2.1 billion appropriation for the Space Station Program, and would allow the remaining funds to be used only to pay termination costs for the Program.

Debate was limited by unanimous consent. Following debate, Senator Bond moved to table the amendment. Generally, those favoring the motion to table opposed the amendment; those opposing the motion to table favored the amendment.

Those favoring the motion to table contended:

Our colleague from Arkansas is as wrong this year about the Space Station Program as he was last year, as he was the year before, as he was every other year he has offered this same tired amendment. Each year, he lengthily mischaracterizes both the cost and the value of the program. His basic argument is always the same: he has a list of experts who say that the Space Station is useless except to gather data necessary to prepare for a flight to Mars. Our response, too, is always the same: we have our list of experts who say that the Space Station will yield enormous practical benefits for Americans, and, each year, we are then able to back our experts up by listing off the advances that have been, and are being, made from the limited amount of space research that has been possible without the Space Station. Our colleague has his theory, but every year the list of results that prove his theory wrong grows; that list will grow explosively as soon as the Space Station is deployed.

(See other side)

YEAS (69)			NAYS (31)		NOT VOTING (0)	
Republicans (44 or 80%)		Democrats (25 or 56%)	Republicans (11 or 20%)	Democrats (20 or 44%)	Republicans (0)	Democrats (0)
Allard	Hatch	Akaka	Abraham	Baucus		
Bennett	Helms	Biden	Ashcroft	Bryan		
Bond	Hutchison	Bingaman	Chafee	Bumpers		
Brownback	Inhofe	Boxer	Collins	Byrd		
Burns	Kempthorne	Breaux	Hutchinson	Conrad		
Campbell	Kyl	Cleland	Jeffords	Dorgan		
Coats	Lott	Daschle	Lugar	Durbin		
Cochran	Mack	Dodd	Snowe	Feingold		
Coverdell	McCain	Feinstein	Specter	Harkin		
Craig	McConnell	Ford	Thomas	Hollings		
D'Amato	Murkowski	Glenn	Warner	Johnson		
DeWine	Nickles	Graham		Kennedy		
Domenici	Roberts	Inouye		Kohl		
Enzi	Roth	Kerrey		Lautenberg		
Faircloth	Santorum	Kerry		Leahy		
Frist	Sessions	Landrieu		Levin		
Gorton	Shelby	Lieberman		Moynihan		
Gramm	Smith, Bob	Mikulski		Reed		
Grams	Smith, Gordon	Moseley-Braun		Wellstone		
Grassley	Stevens	Murray		Wyden		
Gregg	Thompson	Reid				
Hagel	Thurmond	Robb				
		Rockefeller				
		Sarbanes				
		Torricelli				

EXPLANATION OF ABSENCE:

- 1—Official Business
- 2—Necessarily Absent
- 3—Illness
- 4—Other

SYMBOLS:

- AY—Announced Yea
- AN—Announced Nay
- PY—Paired Yea
- PN—Paired Nay

Researchers who already have been conducting microgravity experiments in space would be surprised to hear that having a permanent space station on which they could conduct much longer experiments would be useless. After all, they have already made several key advances. In the pharmaceutical field, scientists have recently discovered the Achilles' heel of the flu bug--they have found that all mutations of the flu virus have the same small molecule that attaches to the host cell, and that molecule must be removed if the virus is going to spread. The Center of Macromolecular Crystallography is using space-grown crystals to design drugs to attach to this small protein molecule. Clinical trials are already starting and relief from flu epidemics will likely start in 2004. Another advance that goes all the way back to the Spacelab mission has enabled Upjohn to develop a new drug that kills ascarids, a roundworm parasite that is often fatal and infects more than 1 billion people worldwide.

Medical advances have not been limited to pharmaceuticals. NASA's space bioreactor has been used to grow human pancreatic islet cells for possible transplantation into diabetic patients. Trial runs have been successful; if this testing continues to advance diabetics may soon need fewer insulin injections and will have fewer complications from their disease. The bioreactor has also been able to grow three-dimensional cancer tissue very similar to human tumors, which is expected to lead to rapid advances in cancer treatment. Yet another example of the value of the bioreactor is that it has been used to grow cartilage; that advance may lead to new cures for arthritis and other joint diseases.

Studying the long-term effects of space flight on astronauts will also likely lead to advances in treating the health effects of aging. Researchers have found that what happens to astronauts after 3 days to 5 days in space is very similar to the normal aging process on earth. Bone density drops; orthostatic intolerance (the inability of the body to keep blood in the upper torso) rises; vestibular and inner-ear balance problems develop; sleep becomes erratic; muscles lose strength; the immune system weakens; and heart activity and glucose levels change. Once astronauts return to Earth their bodies return to normal.

Other key areas of space research that are already yielding tangible benefits include metallurgy and combustion science. For metallurgy, Dr. Glicksman of the Rensselaer Polytechnic Institute recently conducted space experiments that led to new understandings of how the structure of metal forms, which will aid in the development of stronger or more corrosion-resistant metal alloys, and Dr. Szekely of the Massachusetts Institute of Technology developed new mathematical models based on space experiments that will improve predictions of the behavior of metals during processing. For combustion science, the advances promise to be spectacular. Combustion accounts for approximately 85 percent of the world's energy production as well as a significant fraction of the world's atmospheric pollution. Breakthroughs in this field are already yielding tremendous benefits. For instance, Drs. Cheng and Kostuk of the Lawrence Berkeley National Laboratory under contract to NASA were recently awarded a patent for a ring flame stabilizer that was developed using space research. Fitted into an off-the-shelf home heating source, the device reduces nitrogen oxide emissions by a factor of 10 and increases efficiency by 2 percent. The device can be readily sized to industrial scales. We note for our colleagues that the potential annual savings from this one advance from space research is \$8 billion per year, plus it reduces pollution.

We of course do not know what exactly we will discover by creating the Space Station. Over the years, a large number of the most astonishing and helpful scientific breakthroughs that have come from space research have been found to have many applications beyond the purposes for which they were originally intended. One example that most Senators are familiar with is the development of nonflammable clothing for astronauts, which has certainly found an additional use--nonflammable baby pajamas--that all Senators applaud. Literally hundreds of everyday products were derived from America's space programs.

One very recent example of a spin-off advance comes from the much-maligned Hubble telescope. Twenty years ago, we invested in digital technology, despite all the naysayers who said we were wasting our money. When the Hubble telescope was found to be defective, that digital technology was further developed especially for the Hubble, to enable astronomers to distinguish very minute points of light. That technology has now been applied to medical imaging, and as a result doctors are able to detect breast cancer tumors five times better than they formerly were able to detect them.

Our colleagues have complained, as they have complained in prior years, that the United States cannot afford to build the Space Station. In response, spending on the Space Station costs less than one-seventh of 1 percent of the Federal budget. The country is deeply in debt because of the growth of entitlement spending on social welfare programs, not because of the ever declining amount that it spends on scientific research. This program is still on schedule to be fully deployed and operational by 2003, and considering that the Station is already largely built, claims that cost overruns are going to result in huge, unplanned expenses are nonsense. To date, American taxpayers have invested \$19 billion in the Station. We are now within 1 year of the first launch. Russia, Japan, Europe, and Canada have already invested more than half of the \$9 billion they promised when they joined the project (it originally started as an American Space Station but it will now be an International Space Station; the best scientists from all around the world will be able to conduct long-term experiments on this unique orbiting laboratory). The \$94 billion, 10-year cost estimate that the General Accounting Office (GAO) gave is wrong. The GAO mistakenly included \$51 billion that NASA has budgeted for shuttle missions, and it also included the costs of the experiments that will be conducted on the Space Station. The true cost will be \$2.1 billion per year through 2003, because that is the cap under which the program operates. The only recent financial problem has been that Russia, which is having severe financial difficulties, has not come up with its share of the costs. However, Russian scientists are among the best in the world, and Russia, with its vast resources and ongoing reforms, will likely soon rebound. We see this problem

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as only being temporary, and even if it is not it will only lead to a small increase in costs. Finally, for anyone who believes that NASA has escaped the budget ax that has fallen on the rest of the Federal Government, we suggest that NASA has led the way in fiscal responsibility. Under the leadership of Dr. Golden, NASA conducted a zero-based budgeting exercise that resulted in an in-house workforce reduction of 1,000, or nearly 50 percent. NASA has slashed costs in order to be able to afford the Space Station. The Space Station is NASA's top priority.

Senators should always support research, in tight budgetary times as well as in times of plenty. Research is an investment in our children's future instead of in the next election--the benefits of learning and advancing end up making everyone better off. The Space Station Program represents only a very tiny part of the overall Federal budget, but in our opinion, it is one of the best Federal programs ever. Space research now for the United States is basically limited to conducting experiments of 2 weeks or less on shuttle missions and some joint missions on the aging Russian space station Mir (which has more limited capabilities). The extended experiments that will be possible on the Space Shuttle should reap enormous benefits. We are confident that most of our colleagues agree, and will therefore join us in defeating the Bumpers amendment.

Those opposing the motion to table contended:

To date, we have spent \$19 billion on building the Space Station. The General Accounting Office (GAO) has said the total cost of this station over the years will reach \$94 billion. Each year, the cost to complete it goes up, and each year the expectations of what it may achieve go down. We started with the following missions--a staging base, a manufacturing facility, a space-based observatory, a transportation node, a service facility, an assembly facility, a storage facility, and a research facility. All but the last of those missions have been abandoned.

Senators, and NASA scientists, still make claims that it will make a wonderful microgravity research station. However, nearly every expert we have consulted has said that having a manned microgravity research station makes no sense because the movement of the astronauts will ruin the experiments, and further, that doing any microgravity research, whether manned or unmanned, is of marginal value. As Dr. Bloembergen of Harvard summed it up, "microgravity is of microimportance." The American Cancer Society has informed us that it sees no valid justification for favoring space-based cancer research over research on the ground; the American Physical Society has said that medical advances would be unlikely; the Arthritis Foundation has asked that the money for the Space Station be spent building laboratories on Earth instead. Not only will the Space Station not result in discoveries in areas being investigated, it will not result in spin-off discoveries. Frequently, Senators like to claim that space research results in unintended discoveries. As the Wall Street Journal recently reported, though, many of the spin-off products that so many people think came from space research, like velcro, simply did not.

There is one mission for the Space Station that is not commonly discussed. That mission is to gather data on maintaining human life during long-duration space flights in preparation for a flight to Mars. As the late Dr. Carl Sagan, physicist and author, recently put it, "The only tangible and coherent goal of a space station is eventual human missions to near-Earth asteroids, Mars, and beyond. Historically, NASA has been cautious about stating this fact clearly, probably for fear that Members of Congress would throw up their hands in disgust." Dr. Sagan, many NASA scientists, and we do not doubt many of our colleagues favor a manned space flight to Mars. We absolutely do not. We have too many pressing social needs at home. It is the most absolutely misguided set of priorities we can imagine. Going to Mars will not require any new technological achievements. We already have the capability; the only question is whether we are foolish enough to assume the expense.

Scientists know that a space station will not lead to breakthroughs in medicine, metallurgy, or other fields. They also know that the supposed spin-offs that have come from space research have been exaggerated. When all is said and done, this funding is really about whether we are willing to send an astronaut to Mars. We are not, and thus favor the Bumpers amendment.